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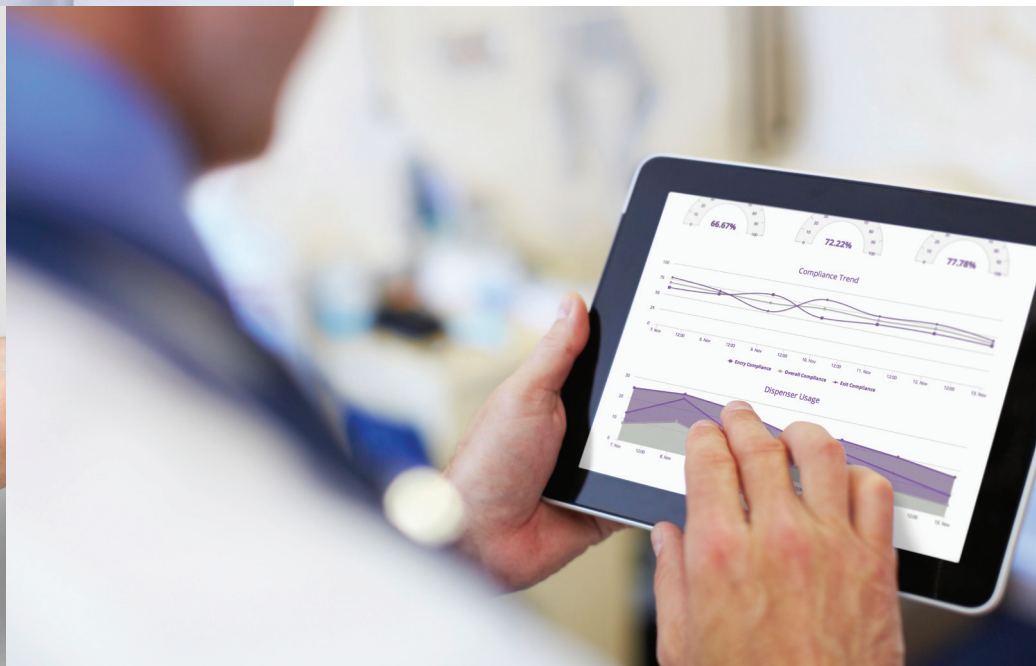

Trading in Pens and Paper for a 21st Century Hand Hygiene Monitoring System

Compliance with hand hygiene guidelines is of utmost importance when it comes to infection control and preventing deadly and costly healthcare associated infections.

According to a 2009 study in the *Journal of Hospital Infections*, "healthcare workers' hands are the most common vehicle for the transmission of healthcare-associated pathogens from patient to patient and within the healthcare environment."

Indeed, the World Health Organization calls hand hygiene a "simple, low-cost action to prevent the spread of many of the microbes that cause healthcare-associated infections." And the Centers for Disease Control and Prevention says, "hand hygiene is one of the most important ways to prevent the spread of infections."

Despite all of this, compliance with hand hygiene protocols remains a struggle in many hospitals, and, in turn, U.S. hospital patients suffer about 722,000 infections and nearly 100,000 die annually, according to CDC data.

"Healthcare-associated infections are an epidemic, but not a permanent part of healthcare. This is a fixable problem," says Mert Iseri, CEO of SwipeSense, which has developed a technology-driven hand hygiene monitoring system. "Hand hygiene happens to be at the top of the list of things we can do to battle HAIs."

In addition to its positive effect on HAI rates, improving hand hygiene compliance can also have a positive effect on a hospital's bottom line. HAIs are costly occurrences – total costs added to the healthcare system from HAIs sits somewhere between $35 billion and $88 billion every year, according to "The Cost of Healthcare Associated Infections," a report from GE Healthcare IT.

Additionally, CMS is no longer reimbursing hospitals for care provided for several hospital-acquired conditions, including catheter-associated urinary tract infections, central line-associated blood stream infections and ventilator-associated pneumonia. That means such infections – which hand hygiene can help prevent – cost hospitals $23,228 on average every time they occur, according to GE Healthcare IT.

Because improving hand hygiene compliance has widespread positive consequences on HAI rates, hospitals are increasingly dedicating more resources to improving adherence. Unfortunately, the old-fashioned ways of measuring hand hygiene aren't very effective.

When hospitals use visual observation as the main system of measuring hand hygiene compliance, they will likely get inflated or unnaturally high numbers that suggest no improvement is needed.

"The old way of monitoring employees for hand hygiene is all subjective; you can't monitor every employee 24/7," says Jeff Baker, SwipeSense's chief commercialization officer.

Cathy Sanders, MSN, RN, director of infection prevention and epidemiology at Brookwood Medical Center in Birmingham, Ala., experienced that phenomenon firsthand. The hospital was using the "secret shopper" method, with employees observing colleagues' hand hygiene habits unbeknownst to them. Over time, however, the method became not-so-secret, with word getting out as to when observations were occurring.

"People would be better that day and consistently report 80 to 100 percent compliance," she says, but on days when infection prevention staff would secretly observe, the recorded compliance rates were closer to roughly 35 percent. That is more on-par with actual hand hygiene compliance at most hospitals.

Mr. Iseri says hospitals no longer have to settle for the archaic way of monitoring hand hygiene. "We're living in a world where pen and paper [hand hygiene monitoring] is acceptable, but it doesn't have to be. The technology is there."

Transitioning from pens and paper to digital monitoring

According to Mr. Baker, "New technology… will allow hospitals to develop a basis for holding people accountable for washing their hands, and it monitors and measures everyone's performance equally."

Using technology to monitor hand hygiene can allow hospitals to not only get a better read on their compliance rates, but they can also use the technology to drive sustainable and meaningful change.

"Technology is required to change behavior," says Mr. Iseri. "It allows people to drive safer, save more money and eat healthier. Lo and behold, more people go to the gym because of their Fitbit." The same concept can apply to hand

hygiene monitoring, since measuring compliance rates and communicating data to employees – like a Fitbit would communicate a step count – can drive improvement and change behavior for the better.

Brookwood Medical Center officials saw potential in updating its hand hygiene strategy and decided to invest in SwipeSense technology to improve hand hygiene compliance and ultimately drive down the rate of HAIs.

The SwipeSense System is "plug and play" in that it works in tandem with hospitals' existing health IT infrastructures. Location beacons are plugged into outlets in patient rooms, and sensors are mounted to the existing wall-mounted soap or alcohol rub dispensers. Both of these sensors interact with a badge worn by hospital staff, typically behind their existing ID badge.

These three sensors interacting with one another allow data to be gathered on worker location and if they washed their hands upon entry and exit of a patient room, two critical moments for hand hygiene.

The installation of the system is fairly simple, and does not require any permanent changes or major construction to hospital walls for the insertion of new wires. The entire installation process takes usually less than three weeks, according to Mr. Baker.

One additional part of the system worth mentioning is its individual point-of-care dispensers. These are filled with hand sanitizer and worn by hospital staff. Any time a worker uses their personal device, the SwipeSense System records that activity as well.

This wearable dispenser allows caregivers to wash every time they touch a patient or something at the bedside without interrupting the flow of care. "If we believe what epidemiology says about stopping the spread of HAIs through hand hygiene, the point-of-care dispenser is very valuable," says Mr. Baker.

Data gathered from these sources can be viewed in near-real time, at an individual level or at a unit level, allowing for nearly immediate feedback on performance. Overall, the use of a technology-driven monitoring solution offers a clear advantage to the old way of doing things.

"Hospitals need to take an objective look at what they're doing. Look around. Do we really give a nurse a clipboard and ask to see if colleagues wash their hands?" Mr. Iseri says. "What year are we living in? It's very obvious that we need to do this with a computer."

Communicating change

Everyone who interacts with patients or enters a patient room at Brookwood Medical Center – from housekeeping and security staff to administrators to clinicians – now wears a SwipeSense badge behind their identification badge, according to Ms. Sanders.

To achieve this comprehensive adoption, Brookwood deployed a comprehensive communication plan so each employee understood the "why" behind the sensors. Announcements about SwipeSense appeared in weekly newsletters, and the hospital produced "teasers" leading up to the launch, explaining bits and pieces of the system to employees. The hospital also has screens throughout the facility that scroll messages, and the change was communicated there as well.

Additionally, the SwipeSense implementation team came to the hospital before launch to help administrators gain an understanding of the system and how it can help reduce HAIs and improve compliance. The SwipeSense team provided administrators with the resources and information they needed to turn and explain the system and the strategy to other staff as well.

Using compliance data constructively

"The best way to change behavior is to tap into the competitive nature of healthcare workers," Mr. Iseri says.

Fortunately, data from SwipeSense can be used perfectly in that fashion.

In fact, that's how Ms. Sanders uses the hand hygiene data at Brookwood – in a "friendly competition." There are contests between units and even within units between shifts, with winners receiving things like coffee shop gift cards or pizza parties.

Additionally, during every morning safety huddle at the hospital, units go over their score from the previous day and highlight any need for improvement. It's important to note, however, that Ms. Sanders does not use the SwipeSense data to punish under-performers. However, she plans to incorporate compliance data into annual reviews.

"Most people, once they see the score, they self-correct," she says. "It's the not knowing what the score is that keeps people being a low-complier."

Knowing that the data won't be used in a negative way has helped staff at Brookwood welcome the system with open arms, something Mr. Iseri has observed in other institutions as well. "We need to turn hand hygiene compliance into something people are proud of and not something they're hiding from," he says. "I'm not interested in punishing people – I'm interested in people washing their hands."

Since the system installation at Brookwood was finalized in June 2015, hand hygiene compliance increased less than six months later. "We've seen

steady improvement every month since June," she says. The hospital was at about 35 percent compliance at the beginning of the install, and by November, that number had already surpassed 50 percent. "It doesn't sound great, but it's steady improvement from where we started."

And, as Mr. Baker says, "If we believe what epidemiology says" about hand hygiene and infections, a drop in HAIs at Brookwood is sure to follow this increase in compliance. Therefore, Brookwood can likely look forward to healthier patients and a stronger bottom line – all because more staff members are vigilant about washing their hands.

Applying the system beyond hand hygiene

While SwipeSense is often implemented as a way to measure and improve hand hygiene compliance through data, it has further applications, according to Mr. Baker.

"It's more than just about hand hygiene and monitoring, it's a risk management tool," he explains. The hospital can look at the SwipeSense dashboard and determine where employees were and for how long, in case a patient raises a compliant or lawsuit. "If someone from the hospital were ever in a litigation case and the question becomes when the last time someone visited a patient was, the hospital can [determine] that because of the SwipeSense technology."

About SwipeSense

SwipeSense transforms the way healthcare organizations manage infection control. Our products ensure every hand hygiene event performed by staff is recorded, along with date, time and location-specific information, to provide risk and infection prevention professionals with the compliance data needed to effectively administer their organization's quality initiatives and correlate hand hygiene data with infection outbreaks.

The SwipeSense System combines point-of-care hand hygiene dispensers, a sensor reporting network for new and existing wall-mounted dispensers, and state-of-the-art informatics so caregiver entry and exit movements at patient rooms and other care areas are automatically captured. This results in a complete audit trail of all hand hygiene activity from across the organization at any time through web-based secured data servers, allowing access to performance data 24/7/365.

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7 Interesting Facts and Findings about Hand Hygiene

By Shannon Barnet

1. A report from The Leapfrog Group based on data taken from the 2014 Leapfrog Hospital Survey of 1,501 U.S. hospitals revealed that **one in four still have not implemented** all the safe practices and policies recommended for proper hand hygiene. Some examples of Leapfrog's standards include having hospitalwide hand hygiene education and training, submitting hand hygiene recommendations and results to the hospital board, holding clinical leadership accountable for compliance and implementing performance improvement programs.

2. Researchers found that a lack of standardization in how hand hygiene-related solutions are arranged at hospital emergency department washbasins may have an effect on performance, in a study published in the *American Journal of Infection Control*. By **standardizing the relative location of handwash solutions**, such as soap on one side and hand drying agents on the other, hospitals may be able to improve hand hygiene behaviors.

3. Senior health **professionals and mentors play an important role** in improving hand hygiene compliance, according to a study published in *Infection Control & Hospital Epidemiology*. For instance, compliance among medical students and healthcare workers in one study was marginally higher among those whose leaders practiced hand hygiene (71 percent) than among groups whose leaders did not (29 percent).

4. A study in the *American Journal of Infection Control* revealed that **healthcare workers touch their faces multiple times each hour**, a habit that could spread germs if hand hygiene compliance is not met. By raising awareness of this habit and its effects, hospitals may be able to improve hand hygiene compliance.

5. The Joint Commission Center for Transforming Healthcare started a patient safety project on hand hygiene in 2008, putting together teams in eight hospitals. Ultimately, the teams found that a **targeted approach to hand hygiene improvement** – focusing improvement efforts on specific issues of noncompliance – can be more effective than a "one-size-fits-all" strategy.

6. When implementing a hand hygiene program, researchers suggest emphasizing **continuous monitoring and immediate feedback** to help increase compliance rates, according to a study in *American Journal of Infection Control*. In the study, a hospital improved hand hygiene compliance by 41 percent in one unit and 36 percent in another by focusing on these areas.

7. Healthcare workers are **less likely to comply with hand hygiene standards** at the end of a shift, particularly if it was a long shift, according to research published in *The Journal of Applied Psychology*. Although the study found that hand hygiene compliance rates dropped by 8.7 percentage points on average from the beginning to the end of a typical, 12-hour work shift, the effect was mitigated by longer breaks between shifts.